19 March 2003
Carl Zeiss Camera Lens Division

Camera Lens News

Newsletter for all who use, buy, sell, like, report about and are interested in Carl Zeiss lenses

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ZEISS

We make it visible.

Camera Lens News No. 19

March 2003

Two more DigiPrime® lenses to be introduced at NAB

NAB 2003 in Las Vegas will see the introduction of two more lenses in the successful Carl Zeiss DigiPrime® lens range for digital cinematography with 24p High Definition cameras.

The Distagon® T* 1.5/28 lens will bridge the gap between the existing 20 mm and 40 mm lenses, while the Distagon® T* 1.5/70 CF lens will extend the line to longer focal lengths while, at the same time, offering extreme close-focusing capability where very high image quality is reached. At the close-focus limit of 33 centimeters in front of the image receiver, mere 6 cm in front of the front lens element, the Distagon® T* 1.5/70 CF lens can frame an object of 38 mm x 51 mm. This is less than half a credit card.

Left to right: Helmut Lenhof, Renee Contreras (BandPro, USA), Christian Bannert, Gerhard Baier (BandPro, Munich), Konelius Müller with the two brand new DigiPrime® lenses

In the foreground: Two new DigiPrime® lenses

The intended purpose of this capability are commercials, where small products or parts thereof are shown close-up with stunningly sharp detail and impressively fill the entire screen.

While working pre-production lenses of the Distagon® T* 1.5/28 lens will be shown at NAB, and will be available for field testing right after the show, the first working units of the Distagon® T* 1.5/70 CF lens will be available at Cinegear in June 2003.

→ Carl Zeiss DigiPrime® Lenses
→ DigiPrime®

Editorial

Dear Readers,

Camera Lens News gives you some practical tips and factual information which will help to give you more certainty in your decisions and better results in your photographic work.

In this issue, for instance, we are presenting a list showing the resolving power that can actually be achieved with photographic films. We will extend this list form time to time, as soon as additional test results become available.

We wish you many hours of enjoyment and success with your Carl Zeiss lenses.

Best wishes

Kornelius J. Müller

Carl Zeiss Tessar® lens – best in performance, lowest in price

In a recent photo magazine test, the famous Carl Zeiss Tessar® lens once again came out winner: "on the bottom line, the Tessar® showed the best overall performance – and this at the most favourable price". This was the conclusion of fotoMAGAZIN, one of the two big monthly German photo magazines. fotoMAGAZIN, in their Jan. 2003 issue, compared four compact standard lenses for 35 mm SLR cameras: the Nikkor 45 mm f/2.8 P, the Pentax SMC-FA 43 mm f/1.9 Limited, the Voigtlaender Ultron 40 mm f/2 SL Aspherical, and the Carl Zeiss Tessar® T* 45 mm f/2.8 MM lens. At Carl Zeiss, we see this as another proof that "the eagle eye of your camera", 101 years after its invention is still a very competitive photographic tool.

→ Carl Zeiss Tessar® T* 2.8/45 Lens
→ Contax

Contax Aria silver with Tessar® T 2.8/45 lens silver (Special Edition 2002)*

Camera Lens News No. 19
March 2003

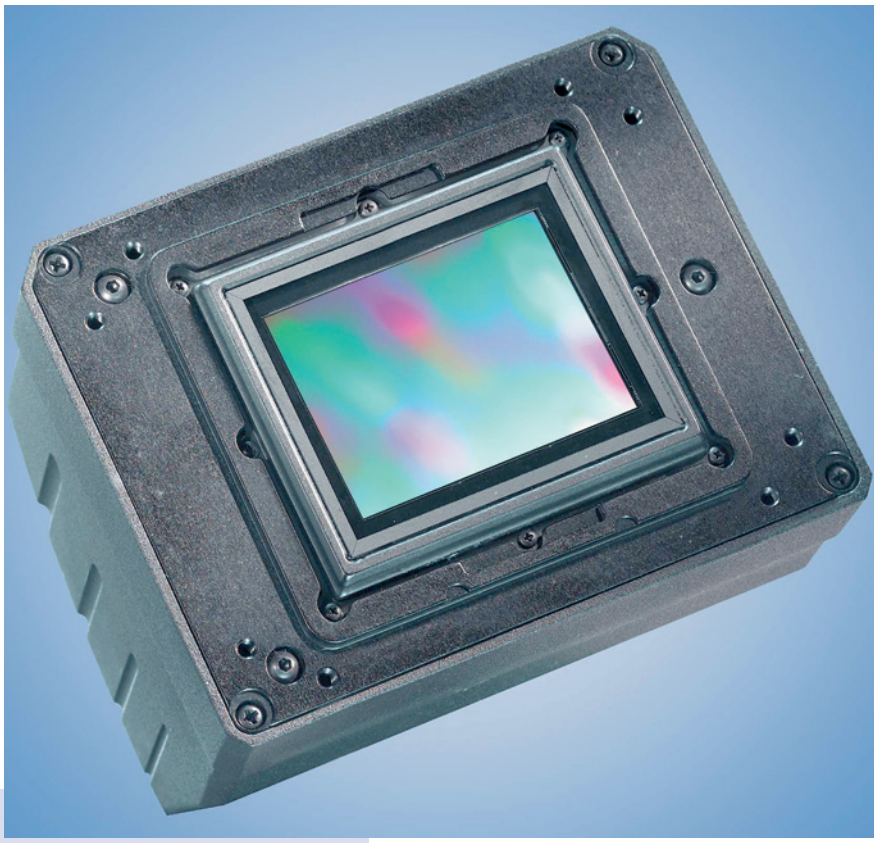
Carl Zeiss Biogon® lens goes digital

The Carl Zeiss Biogon® T 4.5/38 lens and the Sinarback 54 attached to the Alpa camera*

The Carl Zeiss Biogon® T* 4.5/38 lens, the most appreciated lens available for the Swiss Alpa camera, the only interchangeable version of this well-reputed lens, was taken to test recently by Swiss precision product companies Alpa and Sinar. Alpa adapted the new Sinarback 54, a 22 Megapixel digital back for professional medium format cameras. With the Sinarback 54 attached to an Alpa camera, several high performance lenses were compared for effective image quality, among them new digital high resolution lenses from other lensmakers, and the famous Carl Zeiss Biogon® T* 4.5/38 lens in its newest configuration, featuring the new formula using the eco-friendly glasses. The purpose of this test was to find the best lens to deliver very high detail content in the images with very low distortion for a photogrammetric application.

According to Thomas Weber-Capaul of Alpa, the Biogon® lens once again lived up to its reputation of being arguably "the best wide-angle lens in the world": it came out the best of them all. The Biogon® lens, based on an optical formula developed by Dr. Ludwig Bertele in the early 1950s, proved to be better corrected against color fringing than the most recent competing "apo" and "digi" lenses. At Carl Zeiss, we were pleased to hear about this positive real world evaluation and we are proud to share this information with the readers of CLN. It gives further support to our claim that investing in Carl Zeiss lenses is future-proof, when it comes to image quality and optical performance.

→ Carl Zeiss Biogon® T* 4.5/38 lens
→ Alpa
→ Website of André Oldani



Sinarback 54

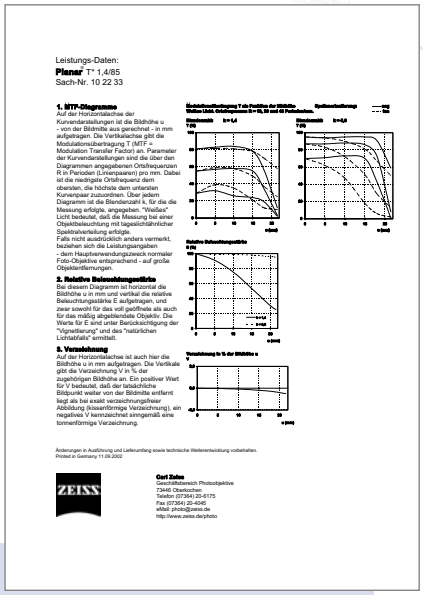
These photos have been taken by André Oldani with an Alpa 12 camera, the Carl Zeiss Biogon® T 4.5/38 lens and the Sinarback 54*

Camera Lens News No. 19

March 2003

Technical data for Carl Zeiss interchangeable lenses

Users of Carl Zeiss lenses take it for granted that Carl Zeiss will "automatically" provide the users with technical data sheets for each and every Carl Zeiss lens on the market. However, we ask you to remember that lens manufacture at Carl Zeiss is a business-to-business activity. We are an OEM supplier. Carl Zeiss supplies lenses to our partners, the camera manufacturers, offers additional services, like data sheets, only at their explicit request. Hasselblad, for instance, orders this service, as does Kyocera for Carl Zeiss Contax interchangeable lenses for all four systems: 645, N, G, and RTS.


Leistungs-Daten:
Planar T* 1,4/85
Sach-Nr. 10 22 33

1. MTF-Diagramme
Auf der Horizontalachse der Kurvendarstellungen ist die Bildhöhe u - von der Bildmitte aus gerechnet - in mm aufgetragen. Die Vertikalachse gibt die Modulationsübertragung T (MTF = Modulation Transfer Factor) an. Parameter der Kurvendarstellungen sind die über den Diagrammen angegebenen Ortsfrequenzen R in Perioden (Linienpaaren) pro mm. Dabei ist die niedrigste Ortsfrequenz dem obersten, die höchste dem untersten Kurvenpaar zuzuordnen. Über jedem Diagramm ist die Blendenzahl k, für die die Messung erfolgte, angegeben. "Weißes" Licht bedeutet, daß die Messung bei einer Objektbeleuchtung mit tageslichtähnlicher Spektralverteilung erfolgte.
Falls nicht ausdrücklich anders vermerkt, beziehen sich die Leistungsangaben - dem Hauptverwendungszweck normaler Foto-Objektive entsprechend - auf große Objektentfernungen.

2. Relative Beleuchtungsstärke
Bei diesem Diagramm ist horizontal die Bildhöhe u in mm und vertikal die relative Beleuchtungsstärke E aufgetragen, und zwar sowohl für das voll geöffnete als auch für das mäßig abgeblendete Objektiv. Die Werte für E sind unter Berücksichtigung der "Vignettierung" und des "natürlichen Lichtabfalls" ermittelt.

3. Verzeichnung
Auf der Horizontalachse ist auch hier die Bildhöhe u in mm aufgetragen. Die Vertikale gibt die Verzeichnung V in % der zugehörigen Bildhöhe an. Ein positiver Wert für V bedeutet, daß der tatsächliche Bildpunkt weiter von der Bildmitte entfernt liegt als bei exakt verzeichnungsfreier Abbildung (kissenförmige Verzeichnung), ein negatives V kennzeichnet sinngemäß eine tonnenförmige Verzeichnung.

Änderungen in Ausführung und Lieferumfang sowie technische Weiterentwicklung vorbehalten.
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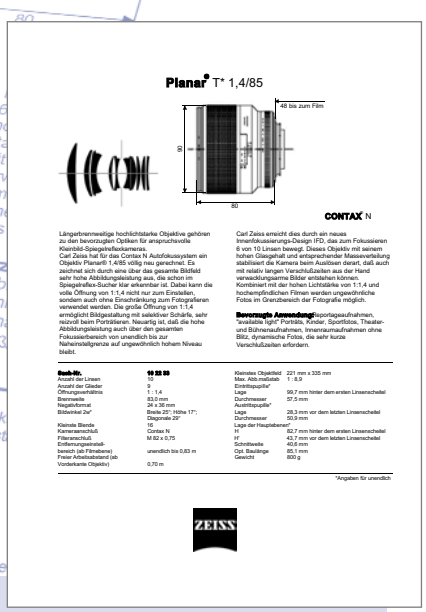
Example of the backside of a data sheet on the basis of the Planar ® T 1.4/85 lens*

Technical data provided in the Carl Zeiss data sheets are not simply taken from the computer simulations carried out during the lens development process since this does not give a true assessment of the actual lens performance. Actual performance is heavily influenced by the manufacturer´s ability, experience and willingness to manufacture the lenses with the extremely tight tolerances required by top quality optics. Instead of just publishing computer simulated data, Carl Zeiss takes measurements on real lenses actually built and publishes this true performance data. However, Carl Zeiss does not publish technical data for lenses manufactured by third parties under Carl Zeiss license, based on a Carl Zeiss lens design but not carrying the Carl Zeiss name, like some of the lenses made by Rollei.

From the perspective of a camera manufacturer the situation looks like this: With a system camera like a 500 series Hasselblad, the user can choose among many different lenses for his camera. The availability of technical data sheets in such a situation, helps the user to make an informed choice and thus utilize his camera system to the fullest. This, in turn, reflects very positively on the reputation of that system. Here again, Hasselblad is a very good example of a system which earned its excellent reputation due to the practical ability of its users, with the NASA among them, to select the optimum lens for the job at hand and show off with extremely good image results.


Planar® T* 1,4/85

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Example of the front of a data sheet on the basis of the Planar ® T 1.4/85 lens*

On a camera with a built-in lens, like a Contax TVS or a Sony DSC-F717, however, the user has taken his irrevocable lens choice automatically upon purchasing the camera. Additional information on the lens itself cannot alter this, since the lens cannot be dealt with separately from the camera. Therefore, camera manufacturers usually do not order lens data for built-in lenses, with the 38 mm Biogon® lens equipped Hasselblad SWC 905 being an exception.

In short:
Lens data sheets are provided by Carl Zeiss

- upon request of the camera manufacturer
- for lenses that are interchangeable
- and bear the Carl Zeiss name.

Carl Zeiss at the "Gulf Imaging & Photo Show" in Dubai

Dubai, under the direction of Sheikh Mohammed bin Raschid al Maktoum, is expanding its "Media City" at a rapid pace. The Dubai Media City is home to a multitude of Cine and TV production facilities, TV channels like mbc and CNN, and related businesses. This holds opportunities for precision optical instruments, like lenses, and related products. Therefore, the "Gulf Imaging & Photo Show" saw ten German manufacturers from the photo industry exhibiting their products at the Dubai Chamber of Commerce and Industry from Feb. 11. through 13. 2003. Carl Zeiss showed photo and cine camera lenses, binoculars, as well as sun glasses. The camera lenses at the Carl Zeiss booth were displayed with the respective cameras from Alpa, Contax, Hasselblad, Sony. Likewise, cine company Arnold & Richter of Munich showed their latest Arriflex and Arricam 35 mm cine cameras with Carl Zeiss/ARRI Ultra Prime® cine lenses, which turned out to be the most effective magnets of attention at the whole show. Adjacent to the Carl Zeiss booth, partner company Rollei Fototechnic (Rolleiflex) of Braunschweig, showed their medium format cameras and the whole line of Carl Zeiss (and Carl Zeiss license) lenses available for these cameras. All three companies made valuable new business contacts in the Middle East during the show. As a result of this exhibition, more ARRI and Carl Zeiss equipment will be available for cine productions in Dubai from 2003 on.

Dubai Chamber Of Commerce & Industry

The booths of Carl Zeiss and Rollei Fototechnic

The most effective magnet of attention at the show: The latest ARRI 35 mm cine cameras with Carl Zeiss lenses

Resolving power of photographic films

13 different films have been tested at Carl Zeiss to find out the maximum performance

Decades ago, when black & withe films were the dominant photographic recording materials, the resolving power was seen by many photo enthusiasts as the deciding factor of photographic quality. Although we at Carl Zeiss are very much aware that resolving power is only one of many criteria which constitute image quality, it is quite important when photos are taken for documentary purposes, where resolving power primarily determines image quality. In documentation, resolving power is one of the most important aspects of image quality. Since Carl Zeiss, by and large, is a company with strong scientific roots and many science related activities, documentation is at the hearts of our photographic mentality. We therefore take the measures needed to design and manufacture our lenses with above average documentation qualities, which includes high resolving power.

This, of course, makes sense only when the resolving potential can actually be utilized with existing films, and is not just mere theory. At Carl Zeiss, we therefore conduct occasional tests to find out about the real-world resolving power of photographic films. As announced in CLN 17, we want to share our results with CLN readers. The tests were conducted by Kornelius Mueller of Carl Zeiss for the the purpose of lens resolution testing and information recording. Error margin is +/- 10 linepairs per millimeter. As we add new test results about new film types in future CLN issues, we will also publish more detailed information on the test target used, and the evaluation of the resolving power, the tools and methods.

Brand	Film	Type	Comment	Resolving Power (lpmm)
Agfa	Agfaortho 25	b & w	discontinued by manufacturer	250
Agfa	APX 25	b & w	discontinued by manufacturer	200
Kodak	Ektar 25	color negative	discontinued by manufacturer	200
Kodak	T-Max 100	b & w		180
Fujifilm	Fujichrome Velvia	color transparency		160
Agfa	Portrait XPS 160	color negative		150
Kodak	Portra 400 b & w	monochrome C-41		150
Kodak	Portra 160 VC	color negative		150
Kodak	Portra 160 NC	color negative		140
Kodak	Ektachrome 100 VS	color transparency		130
Kodak	T-Max 400	b & w		120
Fujifilm	NPZ 800	color negative		110
Kodak	Portra 800	color negative		90

The film manufacturers generally conduct their tests under special, sterile, precisely repeatable laboratory conditions where high performance microscope lenses with resolving powers beyond 1.000 linepairs per millimeter and light sources with very controlled spectrum are used to image the test targets onto film, completely unrelated to any real world photo situation. In contrast, our procedure is based on typical photo conditions like outside sunlight, exposures controlled by normal camera shutters, focusing done with the normal focusing aids of the camera, standard film developing by a normal photo finisher, and of course, using normal Carl Zeiss photographic camera lenses. In other words: we use equipment and techniques which are readily accessible and our results are therefore relevant to every photographer.

The only non-standard tool is used for viewing the films at high magnification: Since we are after resolutions of 200 linepairs per millimeter and significantly beyond, we need a suitable viewing aid for this purpose. With the normal human eye being able to resolve around 5 linepairs per millimeter at normal viewing distance, we need at least 50 x magnification to be able to see 250 linepairs per millimeter dissolved. No loupe would do. So we use a Carl Zeiss SV 11 Apo stereo microscope, which delivers magnifications up to 100 x. Admittedly, this tool may not be part of the normal equipment of a photographer, but it is important to note that the special equipment involves the interpretation, not the performance, of the tests.

Based on our extensive experience over several decades of testing, there (page 6) is our list of film maximum performances, presented in a tabular form.

Comments of Carl Zeiss about the film market, concerning resolving power:

In recent years, high resolution low speed films have been discontined by all large film manufacturers. We found two reasons for this move:

1. Film manufacturers live under the impression, that only few if any lenses are capable of utilizing film resolving powers of 200 linepairs per millimeter and beyond. When Carl Zeiss displayed "The sharpest color photos ever taken" (taken on Kodak Ektar 25) at photokina 1996, those few employees from film manufacturers who saw this display were deeply impressed and finally saw the fruit of their work, resolving power in films, utilized in real world photos. Carl Zeiss may want to repeat such a demonstration and bring it to the awareness of broader circles of the photographic world.

2. Film manufacturers find that low speed films around 25 ISO have become increasingly unpopular. They discontinue these films and concentrate on 100 ISO and faster follower products instead, incresing their resolving power.

Six reasons why the Carl Zeiss Sharp Max™ is superior to other collimators

1. The Carl Zeiss Sharp Max™ uses a 72-sectored Siemens star as internal test target. This multi-sectored version provides a quick and accurate visual detection of the sharpness maximum.

Other collimators use an inexpensive 18-sectored Siemens star, compromising sharpness detection severely.

2. The Carl Zeiss Sharp Max™ is designed and built athermal, using very expensive exotic materials like INVAR-STAHL®. This means that the sharpness readout is reliable and independent of ambient temperatures.

Other collimators completely ignore the problems associated with changing temperatures, compromising reliability severely.

3. The Carl Zeiss Sharp Max™ optics are of high quality and are corrected for

Carl Zeiss Sharp Max™

spherical aberration, meaning that the sharpness readout reliably stays the same regardless of the aperture setting on the camera lens.

Other collimators use undercorrected optics of insufficient quality which produce different back focus readouts at diffenrent aperture settings on the same camera lens, making the back focus calibration unreliable and thus worthless.

4. The optical system of the Carl Zeiss Sharp Max™ provides sufficient accuracy of the collimation process for all focal lengths in the DigiPrime® lens range.

Other collimators incorporate inadequate optics which cannot provide sufficiently accurate results with lenses of 40 mm and more.

5. The brightness of the Carl Zeiss Sharp Max™ test target can be user-adjusted. Other collimators use a simple consumer grade flashlight for illumination with no means of brightness adjustment. Rechargeable batteries can be used and can be re-charged by the Carl Zeiss Sharp Max™´s internal circuitry, once external power is connected. Other collimators are unable to re-charge their batteries. The Carl Zeiss Sharp Max™ can be powered externally by the camera and other power sources. Other collimators fail to utilize external power from the camera and other power sources.

6. The Carl Zeiss Sharp Max™ can be clamped to the lens under test, so the operator´s hands are free for other work.

Other collimators need to be constantly held by hand during the complete calibration procedure.

Carl Zeiss Sharp Max™ together with the complete set of 8 DigiPrime® lenses

Conclusion:
In an industry in which the consistency of the final result is so critically important to the overall success of the enterprise, and where the cost of re-shooting or other post-production manipulation can be extremely high, the value of the Carl Zeiss Sharp Max™ becomes immediately apparent. Anything less would be false economy. We invite you to investigate this for yourselves.

→ Carl Zeiss Sharp Max™
→ DigiPrime®

Publisher's Imprint
Camera Lens News

A newsletter for all who use, buy, sell, like, report about and are interested in Carl Zeiss camera lenses. All information in Camera Lens News is given to the best of our knowledge at the time of publication. Technical specifications of Carl Zeiss products are subject to change.

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